ASO AUTHOR REFLECTIONS

ASO Author Reflections: Identification of the Thoracic Duct using Indocyanine Green During Cervical Lymphadenectomy

Jeffery Chakedis, MD and John E. Phay, MD

Division of Surgical Oncology, Department of Surgery, The Ohio State University Wexner Medical Center and James Cancer Hospital and Solove Research Institute, Columbus, OH

SUMMARY

Past

The key question addressed is the identification and preservation of the thoracic duct, which is a critical step in lateral neck dissection.^{1,2} This is clinically difficult to perform, because the duct is 3- to 5-mm, thin-walled, and often with variant anatomy.³ There have been no intraoperative diagnostic tests that can help to identify or repair thoracic duct injury and prevent the morbidity of a chylous fistula. We investigated whether indocyanine green (ICG) lymphangiography and near-infrared (NIR) imaging is technically feasible to identify the thoracic duct during lateral neck dissection.⁴

Present

This is the first report of a technique to identify the thoracic duct using ICG and NIR imaging.¹ In six patients undergoing lateral modified radical neck dissection for thyroid cancer and melanoma, the techniques successfully identified the thoracic duct in five (83.3%). During the dissection, the left foot was injected with 1-2 mL of ICG, and a handheld NIR probe (PDE-neo II, Hamamatsu) was held at the angle of the

mandible to perform imaging of the space below the clavicle. No injury to the thoracic duct was identified, and there were no chylous fistulas on follow-up. We confirmed the technique was not only feasible but was also simple to perform and added 5–10 min to the operation to perform imaging.

Future

This technique may be a great clinical tool for intraoperative assessment of unidentified thoracic duct injury. We are currently performing a clinical trial to refine the technique and optimize the time from ICG injection to imaging. This trial will produce a standardized set of procedures so that results can be reproducible and accurate. This trial also will involve a more diverse group of patients undergoing neck dissection for head and neck cancers with 5–10 different surgeons performing the technique. Ultimately, this technique may be incorporated into routine practice as a quick method to confirm integrity of the thoracic duct at the end of the procedure.

DISCLOSURE We have no conflicts of interest to disclose.

REFERENCES

1. Chakedis J, Shirley LA, Terando AM, Skoracki R, Phay JE. Identification of the thoracic duct using indocyanine green during cervical lymphadenectomy. *Ann Surg Oncol*. 2018. <https://doi.org/10.1245/s10434-018-6690-4>.
2. Roh JL, Yoon YH, Park CI. Chyle leakage in patients undergoing thyroidectomy plus central neck dissection for differentiated papillary thyroid carcinoma. *Ann Surg Oncol*. 2008;15(9): 2576–80.
3. Brennan PA, Blythe JN, Herd MK, Habib A, Anand R. The contemporary management of chyle leak following cervical thoracic duct damage. *Br J Oral Maxillofac Surg*. 2012;50(3): 197–201.
4. Zelken JA, Tufaro AP. Current Trends and emerging future of indocyanine green usage in surgery and oncology: an update. *Ann Surg Oncol*. 2015;22 Suppl 3:S1271–83.

ASO Author Reflections is a brief invited commentary on the article, “Identification of the Thoracic Duct using Indocyanine Green During Cervical Lymphadenectomy,” *Ann Surg Oncol*. 2018. <https://doi.org/10.1245/s10434-018-6690-4>.

© Society of Surgical Oncology 2018

First Received: 25 July 2018;
Published Online: 31 August 2018

J. E. Phay, MD
e-mail: John.Phay@osumc.edu